

SHELL-COLLECTING ON THE MOSQUITO COAST OF NICARAGUA—II.

BY W. H. FLUCK.

I wish to acknowledge my indebtedness to several naturalists who have helped me in naming and verifying my shells, especially Messrs. Pilsbry, Johnson, Dall, Schick, Shackelford, Hodgson and Ancey. Without their generous help a solitary student like myself would be like the old woman who lived in the shoe, with one difference, trouble about shells, not children.

The localities mentioned in this and in subsequent papers may be found by referring to my map, page 9 of this volume. The names are somewhat blurred owing to rough paper and the reduction of the drawing, but it answers the principal reason for its publication, the location of Wounta Haulover, Wounta, Walfa Siksa, the Keys and Wani.

Spirula peronii Lam.

Wounta Haulover, and everywhere along the coast. No living specimens were found, but perfect shells of this cephalopod, immaculate and beautiful, were taken in quantity. I nearly always found it on the upper reaches of the beach among the dead algae and trash cast up by the sea.

Murex brevifrons Lam.

Wounta Haulover. A specimen is found now and again on the beach, but the shell is not plentiful.

Murex bellus Rve.

Same locality. One dead but perfect shell.

Sistrum nodulosum C. B. Ads.

King's Keys. One shell.

Purpura trinitatensis Guppy.

Man of War Keys.

Cymatium pileare Lam.

Walfa Siksa. On the rocks and sand reaches at this place there is good collecting, especially for bivalves.

Purpura floridana Con.

This is the shell known as *P. hæmastoma* L., var. *floridana* Con. Dr. Dall considers *floridana* of specific value. My shells are very variable in form and marking. Some are smooth-whorled and the color of beach sand; others are studded with one or two rows of

more or less prominent processes, especially on the body whorls, and are more marked than the smooth variety. Found on the beach on logs that were a-wash at high tide. In the dry season, when little fresh water from the Walpa Siksa river enters the sea, these shells are sometimes found on the rocks near the Indian village of the same name nearby.

Purpura patula L.

King's Keys. Man of War Keys. Up to 3 inches long and very beautiful. In the larger specimens the processes and other sculpture are often more or less obliterated. An old and reliable Indian told me that in former times the natives made dye for their loin-cloths—the name of which in their tongue is *palpura*, strange to say—out of molluscs from the keys.

Fasciolaria tulipa L.

Man of War Keys, and abundant on all the others as well, where they are sought after by the natives as an article of food.

Drillia fuscescens Gray.

A single dead shell at Wounta Haulover.

Drillia sp.

Dr. Dall says this is near *D. harfordiana* Rve., perhaps a variety of it. King's Keys.

Latirus cinguliferus Lam.

Man of War Keys.

Melongena melongena L.

Man of War Keys. Also on rocks at Walpa Siksa alive, as well as hundreds of dead shells as hermit-crab houses in the shallow water inside the bar.

Phos? d'orbignyi Payr.

King's Keys. Two specimens.

Pisania pusio L.

Man of War Keys. Numerous. I got eight specimens.

Nassa vibex Say.

Wounta Haulover, and everywhere, in favorable places. In the quiet September sea, when the beach is low, it can be found alive or containing hermit crabs.

Voluta virescens Sol.

In four years I found only four dead shells at Wounta Haulover.

Marginella apicina Mke.

Wounta Haulover. In September and March, especially in the former month, the N. E. trade wind dies away entirely, and instead, the wind blows from the S. or S. E. across South America. By the time it reaches the Caribbean it is the gentlest of zephyrs. The sea becomes as blue as the sky and as calm as a mill-pond on a hot August day. Under such conditions the shallow sea along the shore swarms with small forms of mollusca, and the littoral and laminarian collector is enabled to get forms not obtainable at any other time except by dredging. *M. apicina* is found at this time in quantity.

Marginella guttata Dillw.

Also found at the same place and under similar conditions, but is not as plentiful as the former.

Oliva (Agaronia) testacea Lam.

This little mollusk seems to be absolutely at home in the sand at the bottom of the shallow sea at Wounta Haulover. I think I am safe in saying that this is the commonest *laminarian* univalve on the Caribbean coast of Nicaragua. It is rarely cast up dead. I have taken them alive in quantity whenever the sea was calm enough to feel for them. With the Indian boys of my village I had a standing bargain to purchase all the small forms they brought me. That was before I found my first Olive. I was in bathing one day, when my foot, which soon became a good sub-marine shell-collector, accidentally touched something that got away. I went for it quicker than it takes to write about it, and soon landed my first Olive. It was a prize I was proud of. I schemed out a little plan to get more, and confidentially let my house-boy in on the ground floor. I agreed to pay him 5 cents (silver) for every similar shell. He smiled hopefully, but still I was not suspicious. My hope was to get two or three sets for my friends. The boy soon disappeared, and quietly marshalled the boys of the village, who immediately invaded the sea. In less than an hour this little army confronted me with double handfuls of these Olives. They enjoyed their corner in the Olive market, and began unloading on me at 5 cents per. They allowed me, after an explanation, to make a selection of several dozen at less money. The rest went back into the sea. I kept a few alive in a jar of water and sand for a long time. My observations were of little interest, as the molluscs burrowed in the sand, and seemed to want to go deeper. The foot is large and violet-colored, and with it they dig rapidly.

Columbella mercatoria L.

A few shells from Man of War Keys. On the mainland nothing but fragments were ever found.

Columbella (Anachis) varia Sowb.*Columbella (Anachis) lyrata* Sowb.

Both these forms can be found in large quantities at Wounta Haulover, but always, so far as I remember, as hermit-crab shell. I do not recall ever getting any alive, possibly because I never dredged for them. Every September, for 4 years, my boys and I collected hundreds of them. There is no doubt in my mind that both forms can be had alive not far from the Wounta Haulover beach. If I had known at the time that this was a new locality for *C. varia*, I would have made an effort to secure living specimens.

Engina turbinella Kiener.

Man of War Keys. Two specimens.

Cancellaria reticulata L. Wounta Haulover.

Have also seen it from the keys.

Terebra cinerea Gmel. Wounta Haulover.

Abundant, especially in September, when the sea is calm. At such times it seems to burrow nearer the surface of the sand. It is easily kept in a jar of sea-water and is quite active. Those I had in confinement spent much time creeping about on the sides of the jar like *Limnæas*, displaying their round, disk-like foot.

Terebra hastata Gmel. Same locality.

Rare. Only 3 specimens in 4 years. It probably inhabits deeper water than *T. cinerea*.

(To be Continued.)

A SECOND CONTRIBUTION TO WEST COAST CONCHOLOGY—II.

BY HENRY HEMPHILL.*

I have seen it stated several times by writers on conchology, that in regions where limestone predominates in the geological formation, and consequently becomes the principal element of the soil, that snail shells were or are more abundant (and hence a greater amount

*By typographical error the date of discovery of the islands was given as 1852 on p. 6 of last number, 5th line from top. It should read 1542.